

**AGENDA ITEM: AMENDMENTS TO THE BASIN PLAN FOR THE CONTROL OF
MERCURY IN CACHE CREEK, BEAR CREEK, SULPHUR CREEK, AND HARLEY GULCH**

**SUMMARY OF PUBLIC TESTIMONY AT THE REGIONAL WATER BOARD HEARING ON
23 JUNE 2005 AND STAFF'S WRITTEN RESPONSES**

Comments from hearing speakers are in **bold** type. Staff responses follow in plain type.

Petrea Marchand, Water Resources Coordinator, Yolo County. To fully respond to changes made in the proposed Basin Plan amendment since the May report was released, the County wants a 90-day comment period. The County's main concerns, based on the May version, are the following. First, the proposed plan unfairly burdens local entities by regulating all sources of mercury instead of addressing the most concentrated sources at the beginning. Second, the TMDL will impair the County's ability to do stream and wildlife habitat restoration projects by requiring erosion control plans for every project and potentially costly monitoring. The County does not understand why it is necessary to regulate lower watershed activities if Regional Board staff is claiming that existing laws are adequate. Third, Staff has not fully analyzed the environmental impacts and economics of the TMDL, as required by CEQA and Porter-Cologne. In terms of CEQA, the impacts of the TMDL on habitat restoration efforts have not been considered. Porter Cologne requires the Regional Board to consider economics, which Yolo County attorneys interpret as needing to identify methods to achieve objective and costs to implement those methods. Fourth, the proposed water quality objectives rely on faulty assumptions to protect bald eagles. Fifth, the TMDL does not provide funding for monitoring and remediation of mercury from historic mining activities. A requirement to remediate for any sediment disturbed by projects in the lower watershed makes no sense, given the extensive erosion of mercury-laden material that occurs naturally. The County recommends that that the Board considers a fourth implementation alternative that focuses on upper watershed sources and does not regulate the lower watershed.

Please also see Staff's responses to written comments received from Yolo County on 8 June. The Regional Board extended the public comment period until 20 October 2005, the anticipated date of continuation of the public hearing. Staff released revisions of the Staff Report and proposed Basin Plan Amendment language on 15 August. The revised report was released on 19 August, 62 days prior to the October hearing. In order to ensure time to prepare a written response before the hearing, staff requests that comments on the revised, proposed Basin Plan Amendment be submitted by 5 October (47-day review period).

1. Concern over regulation of all sources of mercury.

Staff has worked extensively with Yolo County and other stakeholders to address this concern. The focus of the proposed plan remains on controlling ongoing inputs from the most concentrated sources of mercury, which are in the upper watershed: inactive mines, stream beds and banks contaminated with mine waste, and upland areas having soil that is enriched in mercury. In the case of the mines, the proposed Basin Plan Amendment would require very significant (95%) reductions in the current loads.

As staff revised the proposed Basin Plan language and Staff Report (August version), requirements for the Cache Creek watershed downstream are limited. The goal for the lower watershed is to maintain existing

conditions, so that improvements from upstream are not reversed by downstream activities. In the revised Basin Plan language, projects conducted in the 10-year floodplain must: 1) implement management practices to control erosion and 2) monitor for turbidity and report results to the Regional Board. The proposed Basin Plan Amendment would also require that any new discharge, including restored wetlands, not increase methylmercury concentration in Cache or Bear Creeks. The Regional Board does not intend to limit restoration or improvement projects. The TMDL and proposed Basin Plan amendments are expected to improve water quality and protect humans and wildlife that consume fish from the Cache Creek watershed. Wetlands projects are able to be flushed and discharge water to the creek, as long as concentrations in the creek do not increase.

2. Erosion control plans needed for every project.

As revised, the proposed Basin Plan Amendment only requires erosion control plans from landowners with enriched soil in the upper watershed. Projects in the 10-year floodplain are only required to implement erosion management practices and do not need to submit an erosion or mercury control plan. While it is true that the proposed Basin Plan Amendment language highlights the need for turbidity monitoring, this requirement is not new. Requirements of projects in the 10-year floodplain for erosion control and turbidity monitoring will be enacted through the existing water quality certification process. In revising the proposed Basin Plan Amendment, staff retained the requirement for no increase in methylmercury concentration in Cache or Bear Creeks from any new discharge (impoundment or constructed wetland). Because Cache Creek is an impaired water body, the requirement for no increase in methylmercury from new projects is needed to prevent improvements that are occurring in the water body from being undone. The Regional Board does not intend to limit restoration or improvement projects.

3. Inadequate environmental impact and cost evaluation.

Staff has reevaluated the potential environmental impacts. At the hearing, Staff Council confirmed that because the water quality objectives are new, there is a requirement to consider economics. For the August BPA report, Staff expanded the economic analysis to show likely costs to achieve the proposed water quality objectives and costs of each of the implementation plan activities.

4. Staff relied on faulty assumptions for mercury levels to protect bald eagles.

After the 23 June hearing, Staff met with representatives of Yolo County and the mercury staff from the US Fish and Wildlife Service to further discuss data needs and methods of calculating methylmercury targets for bald eagles. As advised by the USFWS, staff retained its recommended water quality objective. Please see Staff's response to the County's written comments for details contained in Staff Responses to Comments Received between 13 May and 23 June.

5. TMDL does not provide funding for monitoring and remediation of mercury previously deposited from mining activities.

The Regional Board does not have money available for remediation of mercury in Cache Creek that is a legacy of mining. In the revised Basin Plan Amendment, Staff has the responsibility to monitor creek beds and banks to identify sites containing contaminated sediment that would potentially be feasible to remediate. The proposed Basin Plan Amendment does not require that Yolo County remove mercury now in creek beds and banks that originated from mining activities.

Darell Slotton, UC Davis research ecologist and consultant to Yolo County. The County is concerned over unintended consequences of the TMDL on creation of a riparian and wetland corridor along Cache Creek. I am pleased that the plan as presented at the hearing may not conflict with the County's goals. I have specific comments on the target mercury levels for fish, which appear to be the basis for the implementation plans. The USEPA has a fish-based methylmercury criterion to protect human health (0.3 parts per million). An assumption is often made that that any fish over 0.3 ppm is a problem, but, actually, it's the average of a variety of fish that people catch and eat. Objective Alternative 3 assumes that people only consume large TL4 fish. A more realistic scenario is that about half of a person's intake of methylmercury comes from large bass and catfish (TL4) and the rest comes from a mix of TL3 fish. If people are eating a variety of fish (half from bass and catfish) then the TL4 objective could be 0.4 ppm. It will be a significant accomplishment just to comply with the USEPA criterion, yet Regional Board staff is proposing objectives that are half that level. Staff's recommended objectives, which protect bald eagles, are also unnecessarily low. The TMDL assumes that 58% of the eagle's diet is TL3 fish. Observations indicate, however, that a native fish, the Sacramento sucker, is the main prey of Cache Creek bald eagles. In the Regional Board staff's calculations, fish-eating birds are assumed to have many times the amount of methylmercury than in fish. Thus, even though birds (fish and non-fish eating) are assumed to be a relatively small part (18%) of the eagles' diet, they are estimated to provide more than half of the bald eagle's methylmercury intake. Bird consumption by Cache Creek eagles should be reconsidered. It is not clear that waterfowl are important prey for Cache Creek eagles. There are few waterfowl in the Cache Creek canyon in the winter, when most eagles are present. Waterfowl, such as mergansers that are short-term winter migrants in Cache Creek, likely come from cleaner locations and may have less mercury than expected.

Please see Staff's detailed responses to written comments from Yolo County submitted on 19 April and 8 June 2005. The USEPA encourages the use of site-specific information in applying its human health methylmercury criterion. CDFG Warden Jimenez has stated that the primary fish species caught and kept in Cache Creek are catfish and bass. Therefore, it is appropriate to assume the fish consumed from Cache Creek would be TL4 species.

Staff appreciates Dr. Slotton's familiarity with the Cache Creek watershed, including many observations of bald eagles feeding on Sacramento sucker and a census of waterfowl. To further evaluate these comments, Regional Board Staff met with Dr. Slotton and USFWS mercury experts (T. Mauer and D. Russell) on 8 July 2005. The USFWS that such observations are not an adequate replacement for detailed diet studies of bald eagles from the peer-reviewed scientific literature, upon which the bald eagle methylmercury targets are based. USFWS agrees that mergansers inhabit the Cache Creek watershed for a short period each year. Without testing their methylmercury body burden, though, there is not enough information to predict mercury levels in mergansers. Mercury is a ubiquitous pollutant. It cannot be assumed that bald eagles in the Cache Creek watershed do not feed on other waterfowl at other times of the year, such as nesting herons and egrets (readily available in nearby Anderson Marsh at the Clear Lake outlet). Regional Board and USFWS staff agreed that additional local information would be highly useful and could be used for future adjustments to the methylmercury water quality objectives.

Tom Maurer, US Fish and Wildlife Service: The Sacramento field office of the USFWS assessed methylmercury targets for wildlife as part of evaluating whether the USEPA methylmercury

criterion for humans is protective of wildlife. The methods used by RB staff to develop wildlife-based targets are similar to the USFWS methodology; both received favorable reviews from mercury experts outside the USFWS. The USFWS reviewed the written comments from Yolo County and concludes that the recommended objectives should not be changed. The USFWS agrees with Dr. Slotton that site-specific data on mercury concentration relationships in biota and bald eagle diets could provide a more accurate risk assessment, but these data are lacking.

At the request of Chairman Schneider, Regional Board staff met with Dr. Mauer, Yolo County, and Dr. Slotton to consider Dr. Slotton's suggested revisions to the water quality objectives to protect wildlife species, specifically bald eagles. Please see Staff's response to Dr. Slotton.

Maria Wong, Executive Director, Yolo County Habitat Conservation Joint Powers Agency (JPA). The JPA Board requests a full 90 days to comment on the proposed Basin Plan Amendment. The JPA has several major concerns. First, the vague nature of the implementation alternatives makes it difficult for the JPA to know what will be required of it, both fiscally and legally. The proposed standard for methylmercury in wetlands may be unachievable for the JPA. Second, CEQA requirements have not been adequately addressed. CEQA requires that the lead agency follow proposed actions to their logical conclusion. Perhaps without intention, the proposed Basin Plan Amendment could frustrate implementation of HCPs. Third, it is unclear how the proposed plan will affect working landscapes. In particular, the plan supports grazing moratoriums, which may be counter to restoring some endangered species that depend on grazing to maintain habitat.

Please see Staff's response to written comments submitted by the JPA. The Regional Board extended the public comment period. In the revised (August version) Basin Plan Amendment, Staff clarified its proposals for implementation actions and monitoring and the associated responsible entities. These clarifications and changes should enable the JPA to understand its requirements and estimated costs. In the revised report, Staff clarified that the proposed Basin Plan Amendment would not require that grazing be stopped in order to comply with implementation plan. The word, "moratorium" was used in the context of discussing practices on US Bureau of Land Management property. It is up to the USBLM to choose whether to issue grazing permits on federal land.

Chairman Schneider noted that studies have been conducted elsewhere on grazing impacts on endangered species habitat and have found that grazing is not always needed to maintain the necessary habitat.

Maria Rea, USEPA Region 9: In general, Region 9 supports staff's recommended plan as reflecting the best available science. In particular, the USEPA supports objective Alternative 2 as the only one that will definitely protect human and wildlife health. The USEPA will continue to work with the USFWS and Regional Board staff as technical information about listed species becomes available. The USEPA finds that the TMDLs for Cache Creek, Bear Creek, and Harley Gulch meet federal TMDL requirements. The USEPA appreciates the flexibility provided in the implementation plan to allow for an offset program and would like to work with staff on offset development. The USEPA also supports the habitat restoration goals that other stakeholders support and feel that staff has reached a balance.

(In response to an inquiry from Chairman Schneider as to whether the USEPA's TMDL requirements would be met if the implementation plan did not require mercury reductions or limits on sediment disturbance in lower Cache Creek.)

In general, the State has latitude for this type of strategy in setting an implementation plan. The USEPA will be looking to see if the total allocations and load reductions are consistent with the linkage analysis and meet the water quality standards in the long term. The USEPA can advise Regional Board staff on details if this strategy is pursued.

Wendall Kido, Sacramento Regional County Sanitation District. The proposed plan is correct in focusing on big sources of total mercury. Two components of the plan distract from that focus. First, a blanket prohibition of future increases of mercury loads in Yolo County would be costly. The benefits of the prohibition have not been shown. Second, the plan should focus on managing total mercury, not methylmercury. The proposed TMDL regulates methylmercury as if it were constant, while ignoring the fact that it forms and changes.

In the revised version of the proposed Basin Plan Amendment (August), there is no prohibition on increases in mercury loads. Projects conducted in the channel must implement erosion control practices, which is also a requirement of the current 404 permit.

The plan regulates methylmercury because it is the form of mercury that accumulates in fish and is most toxic. Regarding this concern, please see Staff's response to written comments received from the SRCSD on 8 June 2005, contained in Staff Responses to Comments Received between 13 May and 23 June 2005.

Vicki Murphy, Family Water Alliance. What is the priority assigned to reducing mercury in Cache Creek, considering the greater needs of the Delta and other public policy concerns? What will be the cost and benefit to the Yolo Bypass and the Delta from reducing mercury from Cache Creek? To whom do the TMDLs cost and benefits accrue? It seems like the State is the only beneficiary. What are the time lines for the TMDLs to be in effect? It is true that Sulphur Creek will be getting a pass in the TMDL with respect to its mercury loads to Cache Creek? If there are conflicts between interests in Cache Creek, how will they be settled? For example, the fact that the largest mercury loads come in large storms validates the creation of uplands reservoirs that would trap sediment. What actions will Board take if the designation of Cache Creek as a Wild and Scenic River, either at the state or federal level, causes conflict with implementation?

Ms. Murphy submitted a written copy of all of her testimony spoken at the hearing. Please see Staff's response to her written questions and comments contained in Staff Responses to Comments Received between 13 May and 23 June.2005.

Bill Jennings, representing DeltaKeeper, BayKeeper, the California Sportfishing Protection Alliance, and San Joaquin Audubon Society. He previously did not comment on the TMDL, because he believed that staff had developed a reasonable product. First, the USEPA's human health criterion is not really protective of human health. It represents a few meals a month, not subsistence or tribal levels of fish consumption. Second, the Board cannot put requirements on

upstream operators while allowing downstream operators to undo those efforts. Down stream entities will need to share the burden with the upstream dischargers, who are going to have the bigger burden. It seems that staff has bent over backwards to accommodate County's concerns. The mercury issue should not be characterized as pitting Cache Creek restoration against water quality.

Staff agrees that the human consumption rates that would be safe under the proposed water quality objectives do not fully protect subsistence or high-level consumers. The proposed objectives do allow a higher rate of consumption than the USEPA's default rate for the general population, which was used in USEPA's criterion. Meeting the recommended water quality objectives would require significant improvements in fish concentration levels in the lower watershed. Yet, the proposed objectives seem attainable even in a mercury-laden watershed, as demonstrated by the below-target levels of mercury in fish in North Fork Cache Creek.

Staff has worked very hard to limit the perceived conflict between protecting water quality and enabling restoration. In the proposed implementation plan, lower watershed stakeholders have lesser requirements than some upper watershed stakeholders, but are not absolved of responsibility for meeting the allocations and reducing mercury. Entities working in lower Cache Creek must still manage erosion from their projects and monitor to ensure compliance with Basin Plan objectives. Although the goal of reducing mercury loads is new with this Basin Plan Amendment, erosion control and monitoring turbidity are not. Meeting the limit on methylmercury discharged to Cache Creek may restrict the design of some future wetlands development projects, which could be characterized as a "conflict" with restoration. Staff kept the methylmercury discharge limit in its recommended implementation plan because allowing methylmercury concentrations to increase in the lower section while spending money to reduce upstream concentrations would be counterproductive.

Dr. Richard Miller, owner of 1800 acres in Colusa County including Wilbur Hot Springs. Dr. Miller placed a land conservation easement on land adjoining Wilbur Hot Springs in order to create a nature preserve. The mercury issue is important, but the scientific information you have received is flawed. The mines are being scapegoated as major contributors of mercury. We lack baseline data (going back 150 years) showing the natural loads of mercury and levels in the fish. We do not appear to have any evidence that the mines are really the problem that would justify the expenditure that is being considered. It might be more cost effective to test whether revegetation will inhibit the draining of mercury, rather than requiring expensive projects.

Dr. Miller gave examples of questionable scientific information. First, the report shows three different concentrations of mercury in water from Wilbur Hot Springs, but the samples came from the same source. Knowing that this info is not credible lends causes concern about the rest of the data. Second, the fact that highway roadbeds along Cache Creek were made with mine tailings, but potential loads from the roads have not been taken into account. Third, one scientist warned a Wilbur guest that the water was dangerous, when supposedly collecting information to learn the mercury levels.

(Dr. Miller referred to a fact sheet about mine cleanups that was available at the Board hearing.) **It is disappointing to read that the Regional Board plans to issue cleanup orders for each mine site. He**

was invited to give testimony to the Board as it considered what actions to take, but it appears the decision has already been made.

The Regional Board appreciates hearing from mine owners, who may be deeply affected by this proposed plan to control mercury. At this time, Staff has only proposed issuing cleanup orders; the orders have not been written. The general feeling among Board members and Staff, though, seems to be that inactive mine sites that are releasing mercury should be addressed.

Although knowing the pre-mining loads of mercury in Cache Creek would be useful, it is not necessary for starting a mine cleanup program. Mercury loads increase downstream relative to upstream of mine sites in Harley Gulch and Sulphur Creek. Some natural increase in load is expected downstream of a mineralized area. The proposed implementation plan acknowledges and allows this natural increase. Each of the mine sites, however, has waste rock and, in some cases, ore or tailings piles that contain mercury and are erosive (Churchill and Clinkenbeard, 2004). Mining exposes minerals to the surface, promoting transport of mercury that would otherwise have remained underground. The goal of the proposed plan is to stop the loads of mercury coming from the waste rock, tailings, and other mine-related features. Mine features would include roads on the site that contain waste rock or tailings in the road bed.

Staff believes the data used in the TMLD reports are of high quality. The mercury investigations funded by CALFED had a rigorous quality assurance and quality control (QA/QC) project plan that covered sample collection, storage, preparation and analysis. The QA/QC plan and results are available on the Internet: <http://loer.tamug.tamu.edu/calfed/FinalReports.htm>. Collection and analysis of mercury in soil and rock samples on the mine sites (Churchill and Clinkenbeard, 2004) and some thermal spring data (Suchanek et al., 2004) were funded by CALFED. To obtain data on mercury in Sulphur Creek water samples collected during storms (used for estimates of mercury loads), Regional Board staff carefully followed the CALFED QA/QC plan. Staff is very willing to discuss the data and consider potential flaws. Dr. Miller mentioned the three different levels of mercury measured in samples from the same thermal spring source as one example of questionable data. Heated water and steam pick up minerals as they move through fractured rock to the earth's surface. It is expected that concentrations of minerals in Wilbur Hot Springs vary, as shown by the mercury concentrations in three separate samples.

Max Stevenson, Water Resources Associate, Yolo County Flood Control and Water Conservation District (YCFCWCD). I thank the Board for extending the review period and allowing more time to work with staff. First, the YCFCWCD invites continued dialog with Regional Board staff. The YCFCWCD has extensive local data and experience that has not yet been fully utilized. Second, the additional time is needed to help figure out the role of erosion control in a successful implementation plan. The implementation plan relies on controlling erosion in lower watershed to control loads. This is logical because sediment carries mercury. However, erosion is also expected to clean out mercury-laden sediments. Wanting control of erosion and monitoring of all sources on one hand, and expecting erosion to clean out the system on the other hand, is contradictory. Third, the YCFCWCD appreciates more time to review calculations of the sediment loads and flows. The peer review scientists are experts in other fields and did not examine these calculations.

It is true that the implementation plan depends on erosion to remove much of the mercury-contaminated material in the Cache Creek canyon. Staff has proposed a select program of erosion control that is

intended to decrease the concentration of mercury in creek sediment by reducing inputs of soil with high mercury levels. Erosion control and monitoring are not required on all sources. Erosion control is required on areas with elevated levels of mercury in soil (mines and limited, enriched upper watershed areas identified by the Board) to reduce the amount of soil with high concentrations of mercury from entering the creek. As erosion continues from the non-enriched areas (much larger proportion of the watershed), the concentration of mercury in sediment should decrease.

For projects in the channel from Harley Gulch to the Settling Basin, management practices must be used to limit erosion caused by the project. This requirement is not new with this proposed Basin Plan Amendment. A 401 Water Quality Certification requires that all projects comply with the Basin Plan water quality objectives, including a limit on increases in turbidity allowed from the project. The CCRMP project area already has a 401 certification. The CCRMP itself has goals for erosion control and monitoring.

YCFCWCD staff may review the calculations of mercury and sediment loads. The mercury data and methods are provided in the Cache Creek, Bear Creek and Harley Gulch TMDL for Mercury report, November 2004. Flow data for each of the gauges are available on the internet.

Kevin O'Dea, alluvial geomorphologist, Cache Creek Technical Advisory Committee (TAC). The Cache Creek Resources Management Plan was adopted by Yolo County to coordinate environmentally conscious management of channel instability and habitat restoration along a 14-mile stretch of lower Cache Creek. In the plan area, Cache Creek is transportation, particularly with respect to fine-grained sediment. The TAC is concerned with several issues. First, the definition of local background concentration of mercury in soil was based on limited information. The threshold for cleanup actions (double Staff's background concentration) is similar to regional background numbers that have been reported outside of Cache Creek. Second, sources have not really been defined, whether natural or anthropogenic. This is important for establishing responsibility and opportunities for cleanup. Third, erosion is fundamental to the implementation plan. The CCRMP is trying to encourage landowners to do environmentally sensitive projects to control erosion, but the proposed plan requires additional monitoring of these projects. Fourth, the CCRMP program has developed and instituted performance standards for erosion control and is implementing their 401 Water Quality Certification. The TAC wants to work with the Regional Board to assure sensible monitoring and implementation in lower watershed.

The Regional Board appreciates the work of Yolo County and the TAC to oversee projects conducted in lower Cache Creek. Staff has a three-part response to concerns over sediment data and use. First, Appendix D of the Staff report has been expanded to include more data and description of the studies used. The Regional Board's sediment survey showed low concentrations of mercury (around 0.2 mg/kg) upstream of Harley Gulch. Concentrations were higher in Cache Creek downstream of Harley Gulch, but were 0.2 mg/kg in some canyon tributaries. Concentrations of mercury in suspended sediment leaving Clear Lake and Indian Valley Reservoir are also 0.2-0.3 mg/kg. Staff identified local background mercury and enriched concentrations as tools to prioritize efforts to reduce concentrations of mercury in creek sediment. If typical soil levels, excepting the zones of mineral deposition and mining, are 0.2 mg/kg, it makes sense to control erosion of soil with higher concentrations. Second, the use of the threshold concentration as a trigger for cleanup actions will be limited to areas or subwatersheds upstream

of Rumsey. Activities in the active stream channel are required to follow 401 certifications and 404 permits, but will not have specific requirements for mercury monitoring or control. Only landowners in the upper watershed whose soil contains more than 0.4 mg/kg mercury will be required to identify land use practices that cause erosion and management practices to limit it. Third, there are likely other watersheds in California with similar or higher background mercury concentrations. In the Kearney Foundation's report of trace element concentrations in 50 samples of soil across the state, the average mercury concentration was 0.26 mg/kg; the median was 0.19 mg/kg.

To the maximum extent possible, sources have been identified in the TMDL report. Churchill and Clinkenbeard (2004 CALFED project) estimated loads from the mine sites by feature. They concluded that most of the mine site loads come from erosion of waste rock, tailings and ore piles, which are anthropogenic sources. The proposed Basin Plan Amendment language regarding cleanup allows for further characterization of background loads from a site, if necessary. The large loads coming from the watershed area between the gauges at the dams and Rumsey are assumed to come mainly from mining waste but likely include some contribution from non-anthropogenic erosion. It is difficult to further assign sources to methylmercury that is being formed in creek beds, banks and wetland areas. There are no wastewater treatment plants or similar pipe sources of methylmercury that could be allocated a load.

Regarding concerns over the equivocal role of erosion, please see Staff's response to Max Stephenson.